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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,338	12/21/2001	Shinji Shirakawa	381AS/50803	4728

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EXAMINER

CAMPBELL, KELLY E

ART UNIT	PAPER NUMBER
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3618

DATE MAILED: 01/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,338

Applicant(s)

SHIRAKAWA ET AL.

Examiner

Kelly E Campbell

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) 13-15 and 25-57 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2,5-6,8-9,16,19-20,22-23 and 58-60 is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7 and 10 is/are rejected.
- 7) ☒ Claim(s) 11,12,17,18,21 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 and 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Claims 13-15 and 25-57 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 10.

Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,3-4, 7 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamane et al (US 6,115,270) in view of Boroweic (EP0552981) and Masato (JP 11089247).

Yamane et al teaches a power conversion apparatus, see Figure 1, including a power module part (50) having semiconductor elements (2) for power control, see Column 4, lines 6-9, and a control part (9) for controlling operation of the semiconductor elements (2), see Column 4, lines 15-17;

the power module part (50) including a substrate (17) mounted thereon the semiconductor elements (2); conductors (21), see Figure 4;

and output terminal (19) electrically connected to semiconductor elements (2);

and input terminal (18, P,N) electrically connected to semiconductor elements (2) and composed of positive and negative conductors (18,P,N),

and a container (10) accommodating the semiconductor elements (2), substrate (17) and conductors (21);

Wherein the semiconductor elements (2) are electrically connected to the input (18) and output terminals (19) and extending from the inward side of the container (10), see Figure 2.

Yamane et al does not teach the input/output terminals being arranged opposite the substrate or the conductors being laminated.

Boroweic teaches an arrangement for a power conversion semi conductor apparatus, such that the input and output terminals are arranged opposed to the substrate in different directions, and "associated" input/output terminals and the semiconductor elements are electrically insulated and electrically connected to output terminal, and input terminal, see Column 7, claim 12.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the semiconductor terminal arrangement of the invention of Yamane et al, such that the input/output terminals are arranged oppose to the substrate, in order to further minimize inductance and feedback there between as taught by Boroweic.

Yamane et al modified by Boroweic does not teach the conductors being "laminated".

Masato teaches the conductors being laminated.

It would have been obvious to laminate the structures in a manner taught by Masato, in order to further reduce wiring inductance by the conductors and prevent heating or interference between terminals.

With regards to "two substrates" being provided in semiconductor configuration housing, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the single substrate disclosed above, to include two substrates, in order to provide additional insulation and reduce inductance for the semiconductor arrangements, since it has been held that the mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Allowable Subject Matter

Claims 2,5-6,8-9,16,19-20,22-23 and 58-60 are allowed.

Claims 11-12,17-18,21,24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not disclose or teach a semiconductor element arrangement for power conversion having a power module and operation control part

wherein the two substrates are mounted thereon the semiconductor elements such that the two substrates are arranged in the housing opposed to the input and output terminals being arranged diagonally and extending from the opposed side surfaces of the housing, as well as. The prior art teaches the input terminal conductors being of the same length and not the lower side conductor of the input terminal being extended inward by a length longer than that of the upper side conductor.

With regards to claim 5 and 8, the prior art does not disclose the semiconductor element configuration as discussed above, and further being arranged in a second row, and the first row, are opposed to each other so that the substrates in these rows are diagonally arranged.

With regards to claim 6, the prior art does not disclose the semiconductor element configuration as discussed above, and further being arranged such that the positions of the substrates and positions of the terminals are staggered to one another, are opposed to each other so that the substrates in these rows are diagonally arranged.

With regards to claim 58, the prior art does not disclose the semiconductor element configuration as discussed above, and further being arranged such that the positive and negative conductor elements are stacked upon another and electrically insulate such that a plurality of insulation substrates, output terminals and input terminals are arranged on a conductive member so as to array the insulation substrates and terminals in a checkered pattern.

With regards to claim 59-60, the prior art does not disclose the semiconductor element configuration as discussed above, and further being arranged such that the positive and negative conductor elements are stacked upon another and electrically insulate such that a plurality of insulation substrates, output terminals and input terminals are arranged on a conductive member so as to form loop-like current parts each composed of one of the input terminals, tow of the semi-conductor elements and one of the output terminals.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Deam et al (5,365,424) teaches a power conversion apparatus including a semiconductor configuration having laminated conductors. Ishi et al (5,623,399) teaches a semiconductor configuration for power conversion for an automobile. Dimino et al (5,279,450) teaches a power conversion configuration including an semiconductor arrangement.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly E Campbell whose telephone number is (703) 605-4264. The examiner can normally be reached on 9:00-5:30 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Johnson can be reached on (703) 308-0885. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9326.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.


KEC


BRIAN L. JOHNSON
SUPERVISORY PATENT EXAMINER
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1/12/04